SEQUENCE LISTING

<110> Pettersson-Fernholm, Annika Margareta
Tommassen, Johannes Petrus Maria

<120> Neisseria Lactoferrin Binding Protein

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<141> 2003-12-12

<150> 09/485,760
<151> 2000-02-15

<150> PCT/EP98/05117
<151> 1998-08-10

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Met Cys Lys Pro Asn

1 5

tat ggc ggc att gtc ttg ttg ccc tta ctt ttg gca tct tgt atc ggc 162
Tyr Gly Gly Ile Val Leu Leu Pro Leu Leu Leu Ala Ser Cys Ile Gly
10 15 20

ggc aat ttc ggc gtg cag cct gtt gtc gaa tca acg ccg acc gcg tac 210
Gly Asn Phe Gly Val Gln Pro Val Val Glu Ser Thr Pro Thr Ala Tyr
25 30 35

ccc gtc act ttc aag tct aag gac gtt ccc act ccg ccc cct gcc aaa 258
Pro Val Thr Phe Lys Ser Lys Asp Val Pro Thr Pro Pro Pro Ala Lys
40 45 50

cct tct ata gaa atc acg ccg gtc aac cgg ccc gcc gtc ggt gcg gca 306
Pro Ser Ile Glu Ile Thr Pro Val Asn Arg Pro Ala Val Gly Ala Ala
55 60 65

atg cgg ctg cca agg cgg aat act gct ttt cat cgt gaa gat ggc acg 354
Met Arg Leu Pro Arg Arg Asn Thr Ala Phe His Arg Glu Asp Gly Thr
70 75 80 85

gaa att cca aat agc aaa caa gca gaa gaa aag ctg tcg ttt caa gaa 402
Glu Ile Pro Asn Ser Lys Gln Ala Glu Glu Lys Leu Ser Phe Gln Glu
90 95 100

ggt gat gtt ctg ttt tta tac ggt tca aaa gga aat aaa ctt caa caa 450
Gly Asp Val Leu Phe Leu Tyr Gly Ser Lys Gly Asn Lys Leu Gln Gln
105 110 115

ctt aaa agc gaa att cat aaa cgt gat tcc gat gta gaa att agg aca 498
Leu Lys Ser Glu Ile His Lys Arg Asp Ser Asp Val Glu Ile Arg Thr
120 125 130

tca gaa aag gaa aat aaa aaa tat gat tat aaa ttt gta gat gca ggt 546
Ser Glu Lys Glu Asn Lys Lys Tyr Asp Tyr Lys Phe Val Asp Ala Gly
135 140 145

tat gta tat gta aag gga aaa gat gaa att aag tgg act tca gat tac 594
Tyr Val Tyr Val Lys Gly Lys Asp Glu Ile Lys Trp Thr Ser Asp Tyr
150 155 160 165

aag cag ttt tcc aac cgc tta ggt tat gac ggt ttt gta tat tat tcc 642

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Lys Gln Phe Ser Asn Arg Leu Gly Tyr Asp Gly Phe Val Tyr Tyr Ser
                170                 175                 180

gga gaa cgt cct tcc caa tct tta ccg agt gcg gga acg gtg gaa tat   690
Gly Glu Arg Pro Ser Gln Ser Leu Pro Ser Ala Gly Thr Val Glu Tyr
            185                 190                 195

tct ggt aac tgg caa tat atg acc gat gcc aaa cgt cat cga gca ggt   738
Ser Gly Asn Trp Gln Tyr Met Thr Asp Ala Lys Arg His Arg Ala Gly
        200                 205                 210

aag gcg gtt ggc att gac aat ttg ggt tat tac aca ttt tat ggt aac   786
Lys Ala Val Gly Ile Asp Asn Leu Gly Tyr Tyr Thr Phe Tyr Gly Asn
    215                 220                 225

gat gtt ggt gca act tct tat gcg gct aag gat gtc gac gaa agg gaa   834
Asp Val Gly Ala Thr Ser Tyr Ala Ala Lys Asp Val Asp Glu Arg Glu
230                 235                 240                 245

aaa cat cct gct aaa tat acg gta gat ttc ggt aac aaa acc ctg acg   882
Lys His Pro Ala Lys Tyr Thr Val Asp Phe Gly Asn Lys Thr Leu Thr
                250                 255                 260

ggc gag ctg att aaa aac caa tat gtc aaa ccc agt gag aag caa aaa   930
Gly Glu Leu Ile Lys Asn Gln Tyr Val Lys Pro Ser Glu Lys Gln Lys
            265                 270                 275

ccg ctg acc att tac aac atc act gcc gat tta aac ggc aac cgc ttt   978
Pro Leu Thr Ile Tyr Asn Ile Thr Ala Asp Leu Asn Gly Asn Arg Phe
        280                 285                 290

acc ggc agt gcc aag gtc aat cct gat tta gcg aaa agc cat gcc aat   1026
Thr Gly Ser Ala Lys Val Asn Pro Asp Leu Ala Lys Ser His Ala Asn
    295                 300                 305

aag gag cat ttg ttt ttc cat gcc gat gcc gat cag cgg ctt gag ggc   1074
Lys Glu His Leu Phe Phe His Ala Asp Ala Asp Gln Arg Leu Glu Gly
310                 315                 320                 325

ggt ttt ttc ggc gat aag ggg gaa gag ctt gcc gga cgg ttt atc agc   1122
Gly Phe Phe Gly Asp Lys Gly Glu Glu Leu Ala Gly Arg Phe Ile Ser
                330                 335                 340
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aac gac aac agc gta ttc ggt gta ttc gca ggc aaa caa aat agc ccc   1170
Asn Asp Asn Ser Val Phe Gly Val Phe Ala Gly Lys Gln Asn Ser Pro
            345                 350                 355

gtg ccg tct gga aaa cac acc aaa atc ttg gat tct ctg aaa att tcc   1218
Val Pro Ser Gly Lys His Thr Lys Ile Leu Asp Ser Leu Lys Ile Ser
        360                 365                 370

gtt gat gag gca agt ggt gaa aat ccc cga ccg ttt gcc att tct cct   1266
Val Asp Glu Ala Ser Gly Glu Asn Pro Arg Pro Phe Ala Ile Ser Pro
    375                 380                 385

atg ccc gat ttt ggt cat ccc gac aaa ctt ctt gtc gaa ggg cat gaa   1314
Met Pro Asp Phe Gly His Pro Asp Lys Leu Leu Val Glu Gly His Glu
390                 395                 400                 405

att cct ttg gtt agc caa gag aaa acc atc gag ctt gcc gac ggc agg   1362
Ile Pro Leu Val Ser Gln Glu Lys Thr Ile Glu Leu Ala Asp Gly Arg
                410                 415                 420

aaa atg acc gtc agt gct tgt tgc gac ttt ttg acc tat gtg aaa ctc   1410
Lys Met Thr Val Ser Ala Cys Cys Asp Phe Leu Thr Tyr Val Lys Leu
            425                 430                 435

gga cgg ata aaa acc gaa cgc ccc gcc gcc aaa ccg aag gcg cag gac   1458
Gly Arg Ile Lys Thr Glu Arg Pro Ala Ala Lys Pro Lys Ala Gln Asp
        440                 445                 450

gaa gag gat tcg gac att gat aat ggc gaa gaa agc gaa gac gaa atc   1506
Glu Glu Asp Ser Asp Ile Asp Asn Gly Glu Glu Ser Glu Asp Glu Ile
    455                 460                 465

ggc gat gaa gaa gaa ggc acc gaa gat gca gcc gca gga gat gaa ggc   1554
Gly Asp Glu Glu Glu Gly Thr Glu Asp Ala Ala Ala Gly Asp Glu Gly
470                 475                 480                 485

agc gaa gaa gac gaa gcc aca gaa aac gaa gac ggc gaa gaa gac gaa   1602
Ser Glu Glu Asp Glu Ala Thr Glu Asn Glu Asp Gly Glu Glu Asp Glu
                490                 495                 500

gct gaa gaa cct gaa gaa gaa tcg tcg gca gaa ggc aac ggc agt tca   1650
Ala Glu Glu Pro Glu Glu Glu Ser Ser Ala Glu Gly Asn Gly Ser Ser
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aac gcc atc ctg cct gtc ccg gaa gcc tct aaa ggc agg gat atc gac   1698
Asn Ala Ile Leu Pro Val Pro Glu Ala Ser Lys Gly Arg Asp Ile Asp
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ctt ttc ctg aaa ggt atc cgc acg gca gaa acg aat att ccg caa act   1746
Leu Phe Leu Lys Gly Ile Arg Thr Ala Glu Thr Asn Ile Pro Gln Thr
    535                 540                 545

gga gaa gca cgc tat acc ggc act tgg gaa gcg cgt atc ggc aaa ccc   1794
Gly Glu Ala Arg Tyr Thr Gly Thr Trp Glu Ala Arg Ile Gly Lys Pro
550                 555                 560                 565

att caa tgg gac aat cat gcg gat aaa gaa gcg gca aaa gca gta ttt   1842
Ile Gln Trp Asp Asn His Ala Asp Lys Glu Ala Ala Lys Ala Val Phe
                570                 575                 580

acc gtt gat ttc ggc aag aaa tcg att tcc gga acg ctg acg gag aaa   1890
Thr Val Asp Phe Gly Lys Lys Ser Ile Ser Gly Thr Leu Thr Glu Lys
            585                 590                 595

aac ggt gta gaa cct gct ttc cgt att gaa aac ggc gtg att gag ggc   1938
Asn Gly Val Glu Pro Ala Phe Arg Ile Glu Asn Gly Val Ile Glu Gly
        600                 605                 610

aac ggt ttc cat gcg aca gcg cgc act cgg gat gac ggc atc gac ctt   1986
Asn Gly Phe His Ala Thr Ala Arg Thr Arg Asp Asp Gly Ile Asp Leu
    615                 620                 625

tcc ggg cag ggt tcg acc aaa ccg cag atc ttc aaa gct aat gat ctt   2034
Ser Gly Gln Gly Ser Thr Lys Pro Gln Ile Phe Lys Ala Asn Asp Leu
630                 635                 640                 645

cgt gta gaa gga gga ttt tac ggc ccg aag gcg gag gaa ttg ggc ggt   2082
Arg Val Glu Gly Gly Phe Tyr Gly Pro Lys Ala Glu Glu Leu Gly Gly
                650                 655                 660

att att ttc aat aat gat ggg aaa tct ctt ggt ata act gaa ggt act   2130
Ile Ile Phe Asn Asn Asp Gly Lys Ser Leu Gly Ile Thr Glu Gly Thr
            665                 670                 675

gaa aat aaa gtt gaa gct gat gtt gat gtt gat gtt gat gtt gat gtt   2178
Glu Asn Lys Val Glu Ala Asp Val Asp Val Asp Val Asp Val Asp Val
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        680                 685                 690

gat gct gat gct gat gtt gaa cag tta aaa cct gaa gtt aaa ccc caa   2226
Asp Ala Asp Ala Asp Val Glu Gln Leu Lys Pro Glu Val Lys Pro Gln
    695                 700                 705

ttc ggc gtg gta ttc ggt gcg aag aaa gat aat aaa gag gtg gaa aaa   2274
Phe Gly Val Val Phe Gly Ala Lys Lys Asp Asn Lys Glu Val Glu Lys
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tga                                                               2277
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<213> Neisseria meningitidis strain BNCV

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Thr Pro Thr Ala Tyr Pro Val Thr Phe Lys Ser Lys Asp Val Pro Thr
        35                  40                  45
Pro Pro Pro Ala Lys Pro Ser Ile Glu Ile Thr Pro Val Asn Arg Pro
    50                  55                  60
Ala Val Gly Ala Ala Met Arg Leu Pro Arg Arg Asn Thr Ala Phe His
65                  70                  75                  80
Arg Glu Asp Gly Thr Glu Ile Pro Asn Ser Lys Gln Ala Glu Glu Lys
                85                  90                  95
Leu Ser Phe Gln Glu Gly Asp Val Leu Phe Leu Tyr Gly Ser Lys Gly
            100                 105                 110
Asn Lys Leu Gln Gln Leu Lys Ser Glu Ile His Lys Arg Asp Ser Asp
        115                 120                 125
Val Glu Ile Arg Thr Ser Glu Lys Glu Asn Lys Lys Tyr Asp Tyr Lys
    130                 135                 140
Phe Val Asp Ala Gly Tyr Val Tyr Val Lys Gly Lys Asp Glu Ile Lys
145                 150                 155                 160
Trp Thr Ser Asp Tyr Lys Gln Phe Ser Asn Arg Leu Gly Tyr Asp Gly
                165                 170                 175
Phe Val Tyr Tyr Ser Gly Glu Arg Pro Ser Gln Ser Leu Pro Ser Ala
            180                 185                 190
Gly Thr Val Glu Tyr Ser Gly Asn Trp Gln Tyr Met Thr Asp Ala Lys
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        195                 200                 205
Arg His Arg Ala Gly Lys Ala Val Gly Ile Asp Asn Leu Gly Tyr Tyr
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Thr Phe Tyr Gly Asn Asp Val Gly Ala Thr Ser Tyr Ala Ala Lys Asp
225                 230                 235                 240
Val Asp Glu Arg Glu Lys His Pro Ala Lys Tyr Thr Val Asp Phe Gly
                245                 250                 255
Asn Lys Thr Leu Thr Gly Glu Leu Ile Lys Asn Gln Tyr Val Lys Pro
            260                 265                 270
Ser Glu Lys Gln Lys Pro Leu Thr Ile Tyr Asn Ile Thr Ala Asp Leu
        275                 280                 285
Asn Gly Asn Arg Phe Thr Gly Ser Ala Lys Val Asn Pro Asp Leu Ala
    290                 295                 300
Lys Ser His Ala Asn Lys Glu His Leu Phe Phe His Ala Asp Ala Asp
305                 310                 315                 320
Gln Arg Leu Glu Gly Gly Phe Phe Gly Asp Lys Gly Glu Glu Leu Ala
                325                 330                 335
Gly Arg Phe Ile Ser Asn Asp Asn Ser Val Phe Gly Val Phe Ala Gly
            340                 345                 350
Lys Gln Asn Ser Pro Val Pro Ser Gly Lys His Thr Lys Ile Leu Asp
        355                 360                 365
Ser Leu Lys Ile Ser Val Asp Glu Ala Ser Gly Glu Asn Pro Arg Pro
    370                 375                 380
Phe Ala Ile Ser Pro Met Pro Asp Phe Gly His Pro Asp Lys Leu Leu
385                 390                 395                 400
Val Glu Gly His Glu Ile Pro Leu Val Ser Gln Glu Lys Thr Ile Glu
                405                 410                 415
Leu Ala Asp Gly Arg Lys Met Thr Val Ser Ala Cys Cys Asp Phe Leu
            420                 425                 430
Thr Tyr Val Lys Leu Gly Arg Ile Lys Thr Glu Arg Pro Ala Ala Lys
        435                 440                 445
Pro Lys Ala Gln Asp Glu Glu Asp Ser Asp Ile Asp Asn Gly Glu Glu
    450                 455                 460
Ser Glu Asp Glu Ile Gly Asp Glu Glu Glu Gly Thr Glu Asp Ala Ala
465                 470                 475                 480
Ala Gly Asp Glu Gly Ser Glu Glu Asp Glu Ala Thr Glu Asn Glu Asp
                485                 490                 495
Gly Glu Glu Asp Glu Ala Glu Glu Pro Glu Glu Glu Ser Ser Ala Glu
            500                 505                 510
Gly Asn Gly Ser Ser Asn Ala Ile Leu Pro Val Pro Glu Ala Ser Lys
        515                 520                 525
Gly Arg Asp Ile Asp Leu Phe Leu Lys Gly Ile Arg Thr Ala Glu Thr
    530                 535                 540
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Asn Ile Pro Gln Thr Gly Glu Ala Arg Tyr Thr Gly Thr Trp Glu Ala
545                 550                 555                 560
Arg Ile Gly Lys Pro Ile Gln Trp Asp Asn His Ala Asp Lys Glu Ala
                565                 570                 575
Ala Lys Ala Val Phe Thr Val Asp Phe Gly Lys Lys Ser Ile Ser Gly
            580                 585                 590
Thr Leu Thr Glu Lys Asn Gly Val Glu Pro Ala Phe Arg Ile Glu Asn
        595                 600                 605
Gly Val Ile Glu Gly Asn Gly Phe His Ala Thr Ala Arg Thr Arg Asp
    610                 615                 620
Asp Gly Ile Asp Leu Ser Gly Gln Gly Ser Thr Lys Pro Gln Ile Phe
625                 630                 635                 640
Lys Ala Asn Asp Leu Arg Val Glu Gly Gly Phe Tyr Gly Pro Lys Ala
                645                 650                 655
Glu Glu Leu Gly Gly Ile Ile Phe Asn Asn Asp Gly Lys Ser Leu Gly
            660                 665                 670
Ile Thr Glu Gly Thr Glu Asn Lys Val Glu Ala Asp Val Asp Val Asp
        675                 680                 685
Val Asp Val Asp Val Asp Ala Asp Ala Asp Val Glu Gln Leu Lys Pro
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705                 710                 715                 720
Lys Glu Val Glu Lys
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gca tct tgc atc ggc ggc aat ttc ggc gtg cag cct gtt gtc gaa tca   96
Ala Ser Cys Ile Gly Gly Asn Phe Gly Val Gln Pro Val Val Glu Ser
            20                  25                  30
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acg ccg acc gcg tac ccc gtc act ttc aag tct aag gac gtt ccc act   144
Thr Pro Thr Ala Tyr Pro Val Thr Phe Lys Ser Lys Asp Val Pro Thr
          35                  40                  45

tcg ccc cct gcc ggg tct tcg gta gaa acc acg ccg gtc aac cag ccc   192
Ser Pro Pro Ala Gly Ser Ser Val Glu Thr Thr Pro Val Asn Gln Pro
      50                  55                  60

gcc gtc ggt gcg gca atg cgg ctg ttg aga cgg aat act gct ttt cat   240
Ala Val Gly Ala Ala Met Arg Leu Leu Arg Arg Asn Thr Ala Phe His
 65                  70                  75                  80

cgt gaa gat ggc acg gca att ccc gat agc aaa caa gca gaa gaa aag   288
Arg Glu Asp Gly Thr Ala Ile Pro Asp Ser Lys Gln Ala Glu Glu Lys
                 85                  90                  95

ctg tcg ttt aaa gaa ggt gat gtt ctg ttt tta tac ggt tca aaa gaa   336
Leu Ser Phe Lys Glu Gly Asp Val Leu Phe Leu Tyr Gly Ser Lys Glu
            100                 105                 110

aat aaa ctt caa caa ctt aaa agc gaa att cat aaa cgt aat cct gag   384
Asn Lys Leu Gln Gln Leu Lys Ser Glu Ile His Lys Arg Asn Pro Glu
        115                 120                 125

gca agc att acc aca tcg gaa aat gaa aat aaa aaa tat aat tat cgg   432
Ala Ser Ile Thr Thr Ser Glu Asn Glu Asn Lys Lys Tyr Asn Tyr Arg
    130                 135                 140

ttt gtc agt gcc ggt tat gtg ttt act aaa aac gga aaa gat gaa att   480
Phe Val Ser Ala Gly Tyr Val Phe Thr Lys Asn Gly Lys Asp Glu Ile
145                 150                 155                 160

gag aaa aca tcg gat gaa aag cag ttt tct aat cgt tta ggc tat gac   528
Glu Lys Thr Ser Asp Glu Lys Gln Phe Ser Asn Arg Leu Gly Tyr Asp
                165                 170                 175

ggt ttt gta tat tat ctc gga gaa cat cct tcc caa tct tta ccg agc   576
Gly Phe Val Tyr Tyr Leu Gly Glu His Pro Ser Gln Ser Leu Pro Ser
            180                 185                 190

gcg gga acg gtg aaa tat tcc ggc aac tgg caa tat atg acc gat gcc   624
Ala Gly Thr Val Lys Tyr Ser Gly Asn Trp Gln Tyr Met Thr Asp Ala
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        195                 200                 205

ata cgt cat cgg aga ggt aag ggg gtt tcc agt gtg gat ttg ggt tat   672
Ile Arg His Arg Arg Gly Lys Gly Val Ser Ser Val Asp Leu Gly Tyr
    210                 215                 220

acc aca tat tat ggt aat gaa att ggg gca gct tct tat gag gct agg   720
Thr Thr Tyr Tyr Gly Asn Glu Ile Gly Ala Ala Ser Tyr Glu Ala Arg
225                 230                 235                 240

gat gcc gat ggc cgg gaa aaa cat cct gcc gaa tat acg gtt aat ttc   768
Asp Ala Asp Gly Arg Glu Lys His Pro Ala Glu Tyr Thr Val Asn Phe
                245                 250                 255

gac aaa aaa aac ctg gaa ggt aag ttg att aaa aat cag tat gtg caa   816
Asp Lys Lys Asn Leu Glu Gly Lys Leu Ile Lys Asn Gln Tyr Val Gln
            260                 265                 270

aag aga gat gat cct aaa aat cca ctg acc att tac aac att acc gca   864
Lys Arg Asp Asp Pro Lys Asn Pro Leu Thr Ile Tyr Asn Ile Thr Ala
        275                 280                 285

aca ttg gac ggc aac cgc ttt acc ggc agt gcc aaa gtt agc acc gag   912
Thr Leu Asp Gly Asn Arg Phe Thr Gly Ser Ala Lys Val Ser Thr Glu
    290                 295                 300

gtg aag acg caa cac gct gat aaa gaa tat ttg ttt ttc cat acc gat   960
Val Lys Thr Gln His Ala Asp Lys Glu Tyr Leu Phe Phe His Thr Asp
305                 310                 315                 320

gcc gat cag cgg ctt gag ggc ggt ttt ttc ggc gat aac gga gaa gag  1008
Ala Asp Gln Arg Leu Glu Gly Gly Phe Phe Gly Asp Asn Gly Glu Glu
                325                 330                 335

ctt gcc ggg cgg ttt atc agt aac gac aac agc gta ttc ggc gtg ttc  1056
Leu Ala Gly Arg Phe Ile Ser Asn Asp Asn Ser Val Phe Gly Val Phe
            340                 345                 350

gca ggc aaa caa aaa aca gag aca gca aac gca tca gat aca aat cct  1104
Ala Gly Lys Gln Lys Thr Glu Thr Ala Asn Ala Ser Asp Thr Asn Pro
        355                 360                 365

gcc ctg ccg tct gga aaa cac acc aaa atc ttg gat tct cta aaa att  1152
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Ala Leu Pro Ser Gly Lys His Thr Lys Ile Leu Asp Ser Leu Lys Ile
    370                 375                 380

tcc gtt gac gag gcg act gat gac cat gcc cgt aag ttt gcc att tcc   1200
Ser Val Asp Glu Ala Thr Asp Asp His Ala Arg Lys Phe Ala Ile Ser
385                 390                 395                 400

act atg ccc gat ttt ggt cat ccc gac aaa ctt ctt gtc gaa ggg cgt   1248
Thr Met Pro Asp Phe Gly His Pro Asp Lys Leu Leu Val Glu Gly Arg
                405                 410                 415

gaa att cct ttg gtt agc caa gag aaa acc atc gag ctt gcc gac ggc   1296
Glu Ile Pro Leu Val Ser Gln Glu Lys Thr Ile Glu Leu Ala Asp Gly
            420                 425                 430

agg aaa atg acc atc cgt gct tgt tgc gat ttt ctg acc tat gtg aaa   1344
Arg Lys Met Thr Ile Arg Ala Cys Cys Asp Phe Leu Thr Tyr Val Lys
        435                 440                 445

ctc gga cgg ata aaa acc gac cgc ccc gcc gtc aaa ccg aag gcg cag   1392
Leu Gly Arg Ile Lys Thr Asp Arg Pro Ala Val Lys Pro Lys Ala Gln
    450                 455                 460

gat gaa gag gat tcg gac att gat aat ggc gaa gaa agc gaa gac gaa   1440
Asp Glu Glu Asp Ser Asp Ile Asp Asn Gly Glu Glu Ser Glu Asp Glu
465                 470                 475                 480

att tcc gaa gat gat aac ggc gaa gat gaa gtc acc gaa gaa gag gaa   1488
Ile Ser Glu Asp Asp Asn Gly Glu Asp Glu Val Thr Glu Glu Glu Glu
                485                 490                 495

gct gaa gaa acc gaa gaa gaa act gat gaa gac gaa gag gaa gaa ccc   1536
Ala Glu Glu Thr Glu Glu Glu Thr Asp Glu Asp Glu Glu Glu Glu Pro
            500                 505                 510

gaa gaa act gaa gaa act gaa gaa act gaa gaa act gaa gaa act gaa   1584
Glu Glu Thr Glu Glu Thr Glu Glu Thr Glu Glu Thr Glu Glu Thr Glu
        515                 520                 525

gaa act gaa gaa aaa tcg ccg aca gaa gaa ggc aac ggc ggt tca ggc   1632
Glu Thr Glu Glu Lys Ser Pro Thr Glu Glu Gly Asn Gly Gly Ser Gly
    530                 535                 540
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agc atc ctg ccc act ccg gaa gcc tct aaa ggc agg gac atc gac ctt   1680
Ser Ile Leu Pro Thr Pro Glu Ala Ser Lys Gly Arg Asp Ile Asp Leu
545                 550                 555                 560

ttc ctg aaa ggt atc cgc acg gcg gaa gcc gac att ccg caa att gga   1728
Phe Leu Lys Gly Ile Arg Thr Ala Glu Ala Asp Ile Pro Gln Ile Gly
                565                 570                 575

aaa gca cgc tat acc ggc act tgg gaa gcg cgt atc ggc gtg ccg gat   1776
Lys Ala Arg Tyr Thr Gly Thr Trp Glu Ala Arg Ile Gly Val Pro Asp
            580                 585                 590

aag aaa ggc gaa cag cta gat ggc act acg tcc att caa aag gat agc   1824
Lys Lys Gly Glu Gln Leu Asp Gly Thr Thr Ser Ile Gln Lys Asp Ser
        595                 600                 605

tat gcg aat caa gcg gca aaa gca gaa ttt gac gtt gat ttt ggt gcg   1872
Tyr Ala Asn Gln Ala Ala Lys Ala Glu Phe Asp Val Asp Phe Gly Ala
    610                 615                 620

aag tcg ctt tca ggt aag ttg aca gaa aaa aat gat aca cac ccc gct   1920
Lys Ser Leu Ser Gly Lys Leu Thr Glu Lys Asn Asp Thr His Pro Ala
625                 630                 635                 640

ttt tat att gaa aaa ggt gtg att gat ggc aac ggt ttc cac gct ttg   1968
Phe Tyr Ile Glu Lys Gly Val Ile Asp Gly Asn Gly Phe His Ala Leu
                645                 650                 655

gcg cgt act cgt gaa aat ggt gtt gat ttg tct ggg caa ggt tcg act   2016
Ala Arg Thr Arg Glu Asn Gly Val Asp Leu Ser Gly Gln Gly Ser Thr
            660                 665                 670

aat ccc caa agt ttt aaa gcc agt aat ctt ctc gta gaa gga gga ttt   2064
Asn Pro Gln Ser Phe Lys Ala Ser Asn Leu Leu Val Glu Gly Gly Phe
        675                 680                 685

tat ggt ccg cag gcg gca gag ttg ggt ggt aat att atc gac agt gac   2112
Tyr Gly Pro Gln Ala Ala Glu Leu Gly Gly Asn Ile Ile Asp Ser Asp
    690                 695                 700

cgg aaa atc ggc gtg gta ttc ggt gcg aag aaa gat atg cag gag gtg   2160
Arg Lys Ile Gly Val Val Phe Gly Ala Lys Lys Asp Met Gln Glu Val
705                 710                 715                 720
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gaa aaa tga 2169
Glu Lys

<210> 4
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<212> PRT
<213> Neisseria meningitidis strain M981

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35 40 45
Ser Pro Pro Ala Gly Ser Ser Val Glu Thr Thr Pro Val Asn Gln Pro
50 55 60
Ala Val Gly Ala Ala Met Arg Leu Leu Arg Arg Asn Thr Ala Phe His
65 70 75 80
Arg Glu Asp Gly Thr Ala Ile Pro Asp Ser Lys Gln Ala Glu Glu Lys
85 90 95
Leu Ser Phe Lys Glu Gly Asp Val Leu Phe Leu Tyr Gly Ser Lys Glu
100 105 110
Asn Lys Leu Gln Gln Leu Lys Ser Glu Ile His Lys Arg Asn Pro Glu
115 120 125
Ala Ser Ile Thr Thr Ser Glu Asn Glu Asn Lys Lys Tyr Asn Tyr Arg
130 135 140
Phe Val Ser Ala Gly Tyr Val Phe Thr Lys Asn Gly Lys Asp Glu Ile
145 150 155 160
Glu Lys Thr Ser Asp Glu Lys Gln Phe Ser Asn Arg Leu Gly Tyr Asp
165 170 175
Gly Phe Val Tyr Tyr Leu Gly Glu His Pro Ser Gln Ser Leu Pro Ser
180 185 190
Ala Gly Thr Val Lys Tyr Ser Gly Asn Trp Gln Tyr Met Thr Asp Ala
195 200 205
Ile Arg His Arg Arg Gly Lys Gly Val Ser Ser Val Asp Leu Gly Tyr
210 215 220
Thr Thr Tyr Tyr Gly Asn Glu Ile Gly Ala Ala Ser Tyr Glu Ala Arg
225 230 235 240
Asp Ala Asp Gly Arg Glu Lys His Pro Ala Glu Tyr Thr Val Asn Phe

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                245                 250                 255
Asp Lys Lys Asn Leu Glu Gly Lys Leu Ile Lys Asn Gln Tyr Val Gln
            260                 265                 270
Lys Arg Asp Asp Pro Lys Asn Pro Leu Thr Ile Tyr Asn Ile Thr Ala
        275                 280                 285
Thr Leu Asp Gly Asn Arg Phe Thr Gly Ser Ala Lys Val Ser Thr Glu
    290                 295                 300
Val Lys Thr Gln His Ala Asp Lys Glu Tyr Leu Phe Phe His Thr Asp
305                 310                 315                 320
Ala Asp Gln Arg Leu Glu Gly Gly Phe Phe Gly Asp Asn Gly Glu Glu
                325                 330                 335
Leu Ala Gly Arg Phe Ile Ser Asn Asp Asn Ser Val Phe Gly Val Phe
            340                 345                 350
Ala Gly Lys Gln Lys Thr Glu Thr Ala Asn Ala Ser Asp Thr Asn Pro
        355                 360                 365
Ala Leu Pro Ser Gly Lys His Thr Lys Ile Leu Asp Ser Leu Lys Ile
    370                 375                 380
Ser Val Asp Glu Ala Thr Asp Asp His Ala Arg Lys Phe Ala Ile Ser
385                 390                 395                 400
Thr Met Pro Asp Phe Gly His Pro Asp Lys Leu Leu Val Glu Gly Arg
                405                 410                 415
Glu Ile Pro Leu Val Ser Gln Glu Lys Thr Ile Glu Leu Ala Asp Gly
            420                 425                 430
Arg Lys Met Thr Ile Arg Ala Cys Cys Asp Phe Leu Thr Tyr Val Lys
        435                 440                 445
Leu Gly Arg Ile Lys Thr Asp Arg Pro Ala Val Lys Pro Lys Ala Gln
    450                 455                 460
Asp Glu Glu Asp Ser Asp Ile Asp Asn Gly Glu Glu Ser Glu Asp Glu
465                 470                 475                 480
Ile Ser Glu Asp Asp Asn Gly Glu Asp Glu Val Thr Glu Glu Glu Glu
                485                 490                 495
Ala Glu Glu Thr Glu Glu Glu Thr Asp Glu Asp Glu Glu Glu Glu Pro
            500                 505                 510
Glu Glu Thr Glu Glu Thr Glu Glu Thr Glu Glu Thr Glu Glu Thr Glu
        515                 520                 525
Glu Thr Glu Glu Lys Ser Pro Thr Glu Glu Gly Asn Gly Gly Ser Gly
    530                 535                 540
Ser Ile Leu Pro Thr Pro Glu Ala Ser Lys Gly Arg Asp Ile Asp Leu
545                 550                 555                 560
Phe Leu Lys Gly Ile Arg Thr Ala Glu Ala Asp Ile Pro Gln Ile Gly
                565                 570                 575
Lys Ala Arg Tyr Thr Gly Thr Trp Glu Ala Arg Ile Gly Val Pro Asp
            580                 585                 590
```

```
Lys Lys Gly Glu Gln Leu Asp Gly Thr Thr Ser Ile Gln Lys Asp Ser
        595                 600                 605
Tyr Ala Asn Gln Ala Ala Lys Ala Glu Phe Asp Val Asp Phe Gly Ala
    610                 615                 620
Lys Ser Leu Ser Gly Lys Leu Thr Glu Lys Asn Asp Thr His Pro Ala
625                 630                 635                 640
Phe Tyr Ile Glu Lys Gly Val Ile Asp Gly Asn Gly Phe His Ala Leu
                645                 650                 655
Ala Arg Thr Arg Glu Asn Gly Val Asp Leu Ser Gly Gln Gly Ser Thr
            660                 665                 670
Asn Pro Gln Ser Phe Lys Ala Ser Asn Leu Leu Val Glu Gly Gly Phe
        675                 680                 685
Tyr Gly Pro Gln Ala Ala Glu Leu Gly Gly Asn Ile Ile Asp Ser Asp
    690                 695                 700
Arg Lys Ile Gly Val Val Phe Gly Ala Lys Lys Asp Met Gln Glu Val
705                 710                 715                 720
Glu Lys
```

<210> 5
<211> 2226
<212> DNA
<213> Neisseria meningitidis strain H44/76

<220>
<221> CDS
<222> (1)...(2223)

<400> 5

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atg tgt aaa ccg aat tat ggc ggc att gtc ttg ttg ccc tta ctt ttg   48
Met Cys Lys Pro Asn Tyr Gly Gly Ile Val Leu Leu Pro Leu Leu Leu
 1               5                  10                  15

gca tct tgt att ggc ggc aat ttc ggc gtg cag cct gtt gtc gaa tca   96
Ala Ser Cys Ile Gly Gly Asn Phe Gly Val Gln Pro Val Val Glu Ser
            20                  25                  30

acg ccg acc gcg tac ccc gtc act ttc aag tct aag gac gtt ccc act   144
Thr Pro Thr Ala Tyr Pro Val Thr Phe Lys Ser Lys Asp Val Pro Thr
        35                  40                  45

ccg ccc cct gcc aaa cct tct ata gaa acc acg ccg gtg ccg tca acc   192
```

```
Pro Pro Pro Ala Lys Pro Ser Ile Glu Thr Thr Pro Val Pro Ser Thr
     50                  55                  60

ggg cct gcc gtc ggt gcg gca atg cgg ctg ttg agg cgg att ttc gca   240
Gly Pro Ala Val Gly Ala Ala Met Arg Leu Leu Arg Arg Ile Phe Ala
 65                  70                  75                  80

act tct gat aag gtt ggc aat gat ttt cca aat agc aaa caa gca gaa   288
Thr Ser Asp Lys Val Gly Asn Asp Phe Pro Asn Ser Lys Gln Ala Glu
                 85                  90                  95

gaa aag ctg tcg ttt aaa gaa ggt gat gtt ctg ttt tta tac ggt tca   336
Glu Lys Leu Ser Phe Lys Glu Gly Asp Val Leu Phe Leu Tyr Gly Ser
            100                 105                 110

aaa aaa gat aaa ctt cag tgg ctt aag gat aaa att cat caa cgc aat   384
Lys Lys Asp Lys Leu Gln Trp Leu Lys Asp Lys Ile His Gln Arg Asn
        115                 120                 125

cct aat gta gaa att agg aca tca gaa aat gaa aat aaa aaa tat ggt   432
Pro Asn Val Glu Ile Arg Thr Ser Glu Asn Glu Asn Lys Lys Tyr Gly
    130                 135                 140

tat gaa ttt gtg gat gcc ggt tat gta tat act aaa aac gga aca gat   480
Tyr Glu Phe Val Asp Ala Gly Tyr Val Tyr Thr Lys Asn Gly Thr Asp
145                 150                 155                 160

gaa att gag tgg act tca aat cgc aag cag ttt tct aat cgt ttt ggc   528
Glu Ile Glu Trp Thr Ser Asn Arg Lys Gln Phe Ser Asn Arg Phe Gly
                165                 170                 175

tac gac ggt ttt gta tat tat tcc gga gaa cat cct tcc caa tct tta   576
Tyr Asp Gly Phe Val Tyr Tyr Ser Gly Glu His Pro Ser Gln Ser Leu
            180                 185                 190

ccg agc gcg gga acg gtg caa tat tcc ggt aac tgg caa tat atg acc   624
Pro Ser Ala Gly Thr Val Gln Tyr Ser Gly Asn Trp Gln Tyr Met Thr
        195                 200                 205

gat gcc ata cgt cat cga aca gga aaa gca gga gat cct agc gaa gat   672
Asp Ala Ile Arg His Arg Thr Gly Lys Ala Gly Asp Pro Ser Glu Asp
    210                 215                 220
```

```
ttg ggt tat ctc gtt tat tac ggt caa aat gtc gga gca act tct tat   720
Leu Gly Tyr Leu Val Tyr Tyr Gly Gln Asn Val Gly Ala Thr Ser Tyr
225                 230                 235                 240

gct gcg act gcc gac gac cgg gag gga aaa cat cct gcc gaa tat acg   768
Ala Ala Thr Ala Asp Asp Arg Glu Gly Lys His Pro Ala Glu Tyr Thr
                245                 250                 255

gtt gat ttc gat aag aaa act ttg acg ggt caa tta att aaa aat cag   816
Val Asp Phe Asp Lys Lys Thr Leu Thr Gly Gln Leu Ile Lys Asn Gln
            260                 265                 270

tat gtg caa aag aaa acc gat gaa aag aaa cca ctg acc att tac gac   864
Tyr Val Gln Lys Lys Thr Asp Glu Lys Lys Pro Leu Thr Ile Tyr Asp
        275                 280                 285

att acc gca aca ttg gac ggc aac cgc ttt acc ggc agt gcc aaa gtt   912
Ile Thr Ala Thr Leu Asp Gly Asn Arg Phe Thr Gly Ser Ala Lys Val
    290                 295                 300

aac acc gag ttg aag acg agc cac gct gat aaa gag cat ttg ttt ttc   960
Asn Thr Glu Leu Lys Thr Ser His Ala Asp Lys Glu His Leu Phe Phe
305                 310                 315                 320

cat acc gat gcc gat cag cgg ctt gag ggc ggt ttt ttc ggc gat aag   1008
His Thr Asp Ala Asp Gln Arg Leu Glu Gly Gly Phe Phe Gly Asp Lys
                325                 330                 335

ggg gaa gag ctt gcc gga cgg ttt atc agc aac gac aac agc gta ttc   1056
Gly Glu Glu Leu Ala Gly Arg Phe Ile Ser Asn Asp Asn Ser Val Phe
            340                 345                 350

ggc gta ttc gca ggc aaa aaa aca aac gca tca aac gca gca gat aca   1104
Gly Val Phe Ala Gly Lys Lys Thr Asn Ala Ser Asn Ala Ala Asp Thr
        355                 360                 365

aat cct gct atg ccg tct gaa aaa cac acc aaa atc ttg gat tct ctg   1152
Asn Pro Ala Met Pro Ser Glu Lys His Thr Lys Ile Leu Asp Ser Leu
    370                 375                 380

aaa att tcc gtt gac gag gcg acg gat aaa aat gcc cgc ccg ttt gcc   1200
Lys Ile Ser Val Asp Glu Ala Thr Asp Lys Asn Ala Arg Pro Phe Ala
385                 390                 395                 400
```

```
att tcc cct ctg ccc gat ttt ggc cat ccc gac aaa ctc ctt gtc gaa   1248
Ile Ser Pro Leu Pro Asp Phe Gly His Pro Asp Lys Leu Leu Val Glu
                405                 410                 415

ggg cgt gaa att cct ttg gtt agc caa gag aaa acc atc gag ctt gcc   1296
Gly Arg Glu Ile Pro Leu Val Ser Gln Glu Lys Thr Ile Glu Leu Ala
            420                 425                 430

gac ggc agg aaa atg acc gtc cgt gct tgt tgc gat ttt ctg acc tat   1344
Asp Gly Arg Lys Met Thr Val Arg Ala Cys Cys Asp Phe Leu Thr Tyr
        435                 440                 445

gtg aaa ctc gga cgg ata aaa act gac cgc cca gca agt aaa cca aag   1392
Val Lys Leu Gly Arg Ile Lys Thr Asp Arg Pro Ala Ser Lys Pro Lys
    450                 455                 460

gcg gaa gat aaa ggg aag gat gaa gag gat aca ggc gtt ggt aac gac   1440
Ala Glu Asp Lys Gly Lys Asp Glu Glu Asp Thr Gly Val Gly Asn Asp
465                 470                 475                 480

gaa gaa ggc acg gaa gat gaa gcc gca gaa ggc agc gaa gga ggc gaa   1488
Glu Glu Gly Thr Glu Asp Glu Ala Ala Glu Gly Ser Glu Gly Gly Glu
                485                 490                 495

gac gaa atc ggc gat gaa gga gga ggt gcg gaa gac gaa gcc gca gaa   1536
Asp Glu Ile Gly Asp Glu Gly Gly Gly Ala Glu Asp Glu Ala Ala Glu
            500                 505                 510

aac gaa ggc ggc gaa gaa gac gaa gct gaa gaa cct gaa gaa ccc gaa   1584
Asn Glu Gly Gly Glu Glu Asp Glu Ala Glu Glu Pro Glu Glu Pro Glu
        515                 520                 525

gaa gaa tcg ccg gca gaa ggc ggc ggt ggt ggt tca gac ggc atc ctg   1632
Glu Glu Ser Pro Ala Glu Gly Gly Gly Gly Gly Ser Asp Gly Ile Leu
    530                 535                 540

ccc gct ccg gaa gct cct aaa ggc agg gat atc gac ctt ttc ctg aaa   1680
Pro Ala Pro Glu Ala Pro Lys Gly Arg Asp Ile Asp Leu Phe Leu Lys
545                 550                 555                 560

ggt atc cgc acg gcg gaa gcc gac att ccg caa act gga aaa gca cgc   1728
Gly Ile Arg Thr Ala Glu Ala Asp Ile Pro Gln Thr Gly Lys Ala Arg
```

```
                565                 570                 575

tat acc ggc act tgg gaa gcg cgt atc agc aaa ccc att caa tgg gac   1776
Tyr Thr Gly Thr Trp Glu Ala Arg Ile Ser Lys Pro Ile Gln Trp Asp
            580                 585                 590

aat cat gcg gat aaa aaa gcg gca aaa gca gaa ttt gac gtt gat ttc   1824
Asn His Ala Asp Lys Lys Ala Ala Lys Ala Glu Phe Asp Val Asp Phe
        595                 600                 605

ggc gag aaa tcg att tcc gga acg ctg acg gag aaa aac ggt gta caa   1872
Gly Glu Lys Ser Ile Ser Gly Thr Leu Thr Glu Lys Asn Gly Val Gln
    610                 615                 620

cct gct ttc cat att gaa aac ggc gtg att gag ggc aat ggt ttc cac   1920
Pro Ala Phe His Ile Glu Asn Gly Val Ile Glu Gly Asn Gly Phe His
625                 630                 635                 640

gcg aca gcg cgc act cgg gat aac ggc atc aat ctt tcg gga aat gat   1968
Ala Thr Ala Arg Thr Arg Asp Asn Gly Ile Asn Leu Ser Gly Asn Asp
                645                 650                 655

tcg act aat cct cca agt ttc aaa gcc aat aat ctt ctt gta aca ggc   2016
Ser Thr Asn Pro Pro Ser Phe Lys Ala Asn Asn Leu Leu Val Thr Gly
            660                 665                 670

ggc ttt tac ggc ccg cag gcg gag gaa ttg ggc ggt act att ttc aat   2064
Gly Phe Tyr Gly Pro Gln Ala Glu Glu Leu Gly Gly Thr Ile Phe Asn
        675                 680                 685

aat gat ggg aaa tct ctt ggt ata act gaa gat act gaa aat gaa gct   2112
Asn Asp Gly Lys Ser Leu Gly Ile Thr Glu Asp Thr Glu Asn Glu Ala
    690                 695                 700

gaa gct gaa gtt gaa aat gaa gct ggt gtt ggc gaa cag tta aaa cct   2160
Glu Ala Glu Val Glu Asn Glu Ala Gly Val Gly Glu Gln Leu Lys Pro
705                 710                 715                 720

gaa gct aaa ccc caa ttc ggc gtg gta ttc ggt gcg aag aaa gat aat   2208
Glu Ala Lys Pro Gln Phe Gly Val Val Phe Gly Ala Lys Lys Asp Asn
                725                 730                 735

aaa gag gtg gaa aaa tga                                          2226
```

Lys Glu Val Glu Lys
740

<210> 6
<211> 741
<212> PRT
<213> Neisseria meningitidis strain H44/76

<400> 6
Met Cys Lys Pro Asn Tyr Gly Gly Ile Val Leu Leu Pro Leu Leu Leu
1 5 10 15
Ala Ser Cys Ile Gly Gly Asn Phe Gly Val Gln Pro Val Val Glu Ser
20 25 30
Thr Pro Thr Ala Tyr Pro Val Thr Phe Lys Ser Lys Asp Val Pro Thr
35 40 45
Pro Pro Pro Ala Lys Pro Ser Ile Glu Thr Thr Pro Val Pro Ser Thr
50 55 60
Gly Pro Ala Val Gly Ala Ala Met Arg Leu Leu Arg Arg Ile Phe Ala
65 70 75 80
Thr Ser Asp Lys Val Gly Asn Asp Phe Pro Asn Ser Lys Gln Ala Glu
85 90 95
Glu Lys Leu Ser Phe Lys Glu Gly Asp Val Leu Phe Leu Tyr Gly Ser
100 105 110
Lys Lys Asp Lys Leu Gln Trp Leu Lys Asp Lys Ile His Gln Arg Asn
115 120 125
Pro Asn Val Glu Ile Arg Thr Ser Glu Asn Glu Asn Lys Lys Tyr Gly
130 135 140
Tyr Glu Phe Val Asp Ala Gly Tyr Val Tyr Thr Lys Asn Gly Thr Asp
145 150 155 160
Glu Ile Glu Trp Thr Ser Asn Arg Lys Gln Phe Ser Asn Arg Phe Gly
165 170 175
Tyr Asp Gly Phe Val Tyr Tyr Ser Gly Glu His Pro Ser Gln Ser Leu
180 185 190
Pro Ser Ala Gly Thr Val Gln Tyr Ser Gly Asn Trp Gln Tyr Met Thr
195 200 205
Asp Ala Ile Arg His Arg Thr Gly Lys Ala Gly Asp Pro Ser Glu Asp
210 215 220
Leu Gly Tyr Leu Val Tyr Tyr Gly Gln Asn Val Gly Ala Thr Ser Tyr
225 230 235 240
Ala Ala Thr Ala Asp Asp Arg Glu Gly Lys His Pro Ala Glu Tyr Thr
245 250 255
Val Asp Phe Asp Lys Lys Thr Leu Thr Gly Gln Leu Ile Lys Asn Gln

```
            260                 265                 270
Tyr Val Gln Lys Lys Thr Asp Glu Lys Lys Pro Leu Thr Ile Tyr Asp
        275                 280                 285
Ile Thr Ala Thr Leu Asp Gly Asn Arg Phe Thr Gly Ser Ala Lys Val
    290                 295                 300
Asn Thr Glu Leu Lys Thr Ser His Ala Asp Lys Glu His Leu Phe Phe
305                 310                 315                 320
His Thr Asp Ala Asp Gln Arg Leu Glu Gly Gly Phe Phe Gly Asp Lys
                325                 330                 335
Gly Glu Glu Leu Ala Gly Arg Phe Ile Ser Asn Asp Asn Ser Val Phe
            340                 345                 350
Gly Val Phe Ala Gly Lys Lys Thr Asn Ala Ser Asn Ala Ala Asp Thr
        355                 360                 365
Asn Pro Ala Met Pro Ser Glu Lys His Thr Lys Ile Leu Asp Ser Leu
    370                 375                 380
Lys Ile Ser Val Asp Glu Ala Thr Asp Lys Asn Ala Arg Pro Phe Ala
385                 390                 395                 400
Ile Ser Pro Leu Pro Asp Phe Gly His Pro Asp Lys Leu Leu Val Glu
                405                 410                 415
Gly Arg Glu Ile Pro Leu Val Ser Gln Glu Lys Thr Ile Glu Leu Ala
            420                 425                 430
Asp Gly Arg Lys Met Thr Val Arg Ala Cys Cys Asp Phe Leu Thr Tyr
        435                 440                 445
Val Lys Leu Gly Arg Ile Lys Thr Asp Arg Pro Ala Ser Lys Pro Lys
    450                 455                 460
Ala Glu Asp Lys Gly Lys Asp Glu Glu Asp Thr Gly Val Gly Asn Asp
465                 470                 475                 480
Glu Glu Gly Thr Glu Asp Glu Ala Ala Glu Gly Ser Glu Gly Gly Glu
                485                 490                 495
Asp Glu Ile Gly Asp Glu Gly Gly Gly Ala Glu Asp Glu Ala Ala Glu
            500                 505                 510
Asn Glu Gly Gly Glu Glu Asp Glu Ala Glu Glu Pro Glu Glu Pro Glu
        515                 520                 525
Glu Glu Ser Pro Ala Glu Gly Gly Gly Gly Gly Ser Asp Gly Ile Leu
    530                 535                 540
Pro Ala Pro Glu Ala Pro Lys Gly Arg Asp Ile Asp Leu Phe Leu Lys
545                 550                 555                 560
Gly Ile Arg Thr Ala Glu Ala Asp Ile Pro Gln Thr Gly Lys Ala Arg
                565                 570                 575
Tyr Thr Gly Thr Trp Glu Ala Arg Ile Ser Lys Pro Ile Gln Trp Asp
            580                 585                 590
Asn His Ala Asp Lys Lys Ala Ala Lys Ala Glu Phe Asp Val Asp Phe
        595                 600                 605
```

```
Gly Glu Lys Ser Ile Ser Gly Thr Leu Thr Glu Lys Asn Gly Val Gln
    610                 615                 620
Pro Ala Phe His Ile Glu Asn Gly Val Ile Glu Gly Asn Gly Phe His
625                 630                 635                 640
Ala Thr Ala Arg Thr Arg Asp Asn Gly Ile Asn Leu Ser Gly Asn Asp
                645                 650                 655
Ser Thr Asn Pro Pro Ser Phe Lys Ala Asn Asn Leu Leu Val Thr Gly
            660                 665                 670
Gly Phe Tyr Gly Pro Gln Ala Glu Glu Leu Gly Gly Thr Ile Phe Asn
        675                 680                 685
Asn Asp Gly Lys Ser Leu Gly Ile Thr Glu Asp Thr Glu Asn Glu Ala
    690                 695                 700
Glu Ala Glu Val Glu Asn Glu Ala Gly Val Gly Glu Gln Leu Lys Pro
705                 710                 715                 720
Glu Ala Lys Pro Gln Phe Gly Val Val Phe Gly Ala Lys Lys Asp Asn
                725                 730                 735
Lys Glu Val Glu Lys
            740
```

<210> 7
<211> 2262
<212> DNA
<213> Neisseria meningitidis strain M990

<220>
<221> CDS
<222> (1)...(2259)

<400> 7

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atg tgt aaa ccg aat tat ggc ggc att gtc ttg ttg ccc tta ctt tta   48
Met Cys Lys Pro Asn Tyr Gly Gly Ile Val Leu Leu Pro Leu Leu Leu
 1               5                  10                  15

gca tct tgt atc ggc ggc aat ttc ggc gta cag cct gtt gtc gaa tca   96
Ala Ser Cys Ile Gly Gly Asn Phe Gly Val Gln Pro Val Val Glu Ser
            20                  25                  30

acg ccg acc gcg cca act ctg tca gat tcc aaa tct tcc aat cct gcg   144
Thr Pro Thr Ala Pro Thr Leu Ser Asp Ser Lys Ser Ser Asn Pro Ala
        35                  40                  45

gat aag cct gct cca gct cct gcc gag cct tcg gta gaa atc acg ccg   192
```

```
Asp Lys Pro Ala Pro Ala Pro Ala Glu Pro Ser Val Glu Ile Thr Pro
     50                  55                  60

gtc aag cgg ccc gcc gtc ggt gcg gca atg cgg ctg cca agg cgg aat   240
Val Lys Arg Pro Ala Val Gly Ala Ala Met Arg Leu Pro Arg Arg Asn
 65                  70                  75                  80

atc gca act ttt gat aaa aat ggt aat gaa att ccc aat agt aag cag   288
Ile Ala Thr Phe Asp Lys Asn Gly Asn Glu Ile Pro Asn Ser Lys Gln
                 85                  90                  95

gca gag gag tat ctg ccg ctc aaa gag aag gat atc ctg ttt tta gac   336
Ala Glu Glu Tyr Leu Pro Leu Lys Glu Lys Asp Ile Leu Phe Leu Asp
            100                 105                 110

ggt acg ccg aaa gaa cag gct gac aaa ctt aaa aag gaa atc aac gga   384
Gly Thr Pro Lys Glu Gln Ala Asp Lys Leu Lys Lys Glu Ile Asn Gly
        115                 120                 125

cgg cat cct aat gca cca atc tac acg tcc gat tta aaa gat gat gcg   432
Arg His Pro Asn Ala Pro Ile Tyr Thr Ser Asp Leu Lys Asp Asp Ala
    130                 135                 140

tat caa tat aaa tat gtc cgg gcc gga tat gtt tat act aga tat gga   480
Tyr Gln Tyr Lys Tyr Val Arg Ala Gly Tyr Val Tyr Thr Arg Tyr Gly
145                 150                 155                 160

aca gat gaa atc gaa cag aac tca ggc ggt aag cgg gtt acc cac cgc   528
Thr Asp Glu Ile Glu Gln Asn Ser Gly Gly Lys Arg Val Thr His Arg
                165                 170                 175

tta ggt tat gac ggt ttt gta tat tat tcc gga gaa cgt cct tcc caa   576
Leu Gly Tyr Asp Gly Phe Val Tyr Tyr Ser Gly Glu Arg Pro Ser Gln
            180                 185                 190

tct tta ccg agt gcg gga acg gtg gaa tat tct ggt aac tgg caa tat   624
Ser Leu Pro Ser Ala Gly Thr Val Glu Tyr Ser Gly Asn Trp Gln Tyr
        195                 200                 205

atg acc gat gcc aaa cgt cat cga gca ggt cag gcg gtt ggc att gac   672
Met Thr Asp Ala Lys Arg His Arg Ala Gly Gln Ala Val Gly Ile Asp
    210                 215                 220
```

```
aat ttg ggt tat atc aca ttt tat ggt aac gat gtt ggt gca act tct   720
Asn Leu Gly Tyr Ile Thr Phe Tyr Gly Asn Asp Val Gly Ala Thr Ser
225                 230                 235                 240

tat gcg gct aag gat gtc gac gaa agg gaa aag cat cct gcc aaa tat   768
Tyr Ala Ala Lys Asp Val Asp Glu Arg Glu Lys His Pro Ala Lys Tyr
                245                 250                 255

acg gtt gat ttt gat aac aaa acc atg aat ggc aag ctg att aaa aat   816
Thr Val Asp Phe Asp Asn Lys Thr Met Asn Gly Lys Leu Ile Lys Asn
            260                 265                 270

cag tat gtg cga aat aaa aaa gat gaa ccc aaa aaa ccg ctg acc att   864
Gln Tyr Val Arg Asn Lys Lys Asp Glu Pro Lys Lys Pro Leu Thr Ile
        275                 280                 285

tac gac att act gca aaa ttg gac ggc aac cgc ttt acc ggc agt gcc   912
Tyr Asp Ile Thr Ala Lys Leu Asp Gly Asn Arg Phe Thr Gly Ser Ala
    290                 295                 300

aag gtc aat cct gat tta gcg aaa aac ctt gcc ggt aat gag cgt ttg   960
Lys Val Asn Pro Asp Leu Ala Lys Asn Leu Ala Gly Asn Glu Arg Leu
305                 310                 315                 320

ttt ttc cat gcc gat gcc gat cag cgg ctt gag ggc ggt ttt ttc ggc   1008
Phe Phe His Ala Asp Ala Asp Gln Arg Leu Glu Gly Gly Phe Phe Gly
                325                 330                 335

gat aac gga gaa gag ctt gcc gga cgg ttt atc agc aac gac aac agc   1056
Asp Asn Gly Glu Glu Leu Ala Gly Arg Phe Ile Ser Asn Asp Asn Ser
            340                 345                 350

gta ttc ggc gta ttc gca ggc aaa aaa aca gag aca gca aac gca gca   1104
Val Phe Gly Val Phe Ala Gly Lys Lys Thr Glu Thr Ala Asn Ala Ala
        355                 360                 365

gat aca aaa cct gcc ctg ccg tct gga aaa cac acc aaa atc ttg gat   1152
Asp Thr Lys Pro Ala Leu Pro Ser Gly Lys His Thr Lys Ile Leu Asp
    370                 375                 380

tct cta aaa att tcc gtt gac gag gcg act gat ggc cat gcc cgt aag   1200
Ser Leu Lys Ile Ser Val Asp Glu Ala Thr Asp Gly His Ala Arg Lys
385                 390                 395                 400
```

```
ttt gcc att tcc tct atg ccc gat ttt ggt cat ccc gac aaa ctt ctt   1248
Phe Ala Ile Ser Ser Met Pro Asp Phe Gly His Pro Asp Lys Leu Leu
                405                 410                 415

gtc gaa ggg cgt gaa att cct ttg gta aac gaa gaa caa atc atc aag   1296
Val Glu Gly Arg Glu Ile Pro Leu Val Asn Glu Glu Gln Ile Ile Lys
            420                 425                 430

ctt gcc gac ggc agg aaa atg acc gtc cgt gct tgt tgc gac ttt ttg   1344
Leu Ala Asp Gly Arg Lys Met Thr Val Arg Ala Cys Cys Asp Phe Leu
        435                 440                 445

acc tat gtg aaa ctc gga cgg ata aaa acc gat cgc ccg gca agt aaa   1392
Thr Tyr Val Lys Leu Gly Arg Ile Lys Thr Asp Arg Pro Ala Ser Lys
    450                 455                 460

cca aag gcg gaa gat aaa ggg gag gat gaa gag ggt gca ggc gtt gat   1440
Pro Lys Ala Glu Asp Lys Gly Glu Asp Glu Glu Gly Ala Gly Val Asp
465                 470                 475                 480

aac gac gaa gaa agc gaa gac gaa gcc gta gaa gac gaa ggc ggc gaa   1488
Asn Asp Glu Glu Ser Glu Asp Glu Ala Val Glu Asp Glu Gly Gly Glu
                485                 490                 495

gaa gac gaa act tcc gaa gag gat aat ggc gaa gac gaa gaa gca acc   1536
Glu Asp Glu Thr Ser Glu Glu Asp Asn Gly Glu Asp Glu Glu Ala Thr
            500                 505                 510

gcc gaa gaa gaa acc gaa gaa gtt gat gaa gcc gaa gag gag gaa gtt   1584
Ala Glu Glu Glu Thr Glu Glu Val Asp Glu Ala Glu Glu Glu Glu Val
        515                 520                 525

gaa gaa ccc gaa gaa aaa tcg ccg gca gaa ggc aac ggc ggt tca ggc   1632
Glu Glu Pro Glu Glu Lys Ser Pro Ala Glu Gly Asn Gly Gly Ser Gly
    530                 535                 540

agc atc ctg cct gcc cta gaa gcc tct aaa ggc agg gac atc gac ctt   1680
Ser Ile Leu Pro Ala Leu Glu Ala Ser Lys Gly Arg Asp Ile Asp Leu
545                 550                 555                 560

ttc ctg aaa ggt atc cgc acg gca gaa acg gat att ccg caa agc gga   1728
Phe Leu Lys Gly Ile Arg Thr Ala Glu Thr Asp Ile Pro Gln Ser Gly
```

```
                565                 570                 575

acg gcg cat tat acc ggc act tgg gaa gcg cgt atc ggc aaa ccc att   1776
Thr Ala His Tyr Thr Gly Thr Trp Glu Ala Arg Ile Gly Lys Pro Ile
            580                 585                 590

caa tgg gac aat cag gcg gat gaa aaa gcg gca aaa gca gaa ttt acc   1824
Gln Trp Asp Asn Gln Ala Asp Glu Lys Ala Ala Lys Ala Glu Phe Thr
        595                 600                 605

gtt gat ttc gac aag aaa tcg att tcc gga aag ctg acg gag caa aac   1872
Val Asp Phe Asp Lys Lys Ser Ile Ser Gly Lys Leu Thr Glu Gln Asn
    610                 615                 620

ggc gta gaa cct gct ttc cat att gaa gac ggc aag att gat ggc aac   1920
Gly Val Glu Pro Ala Phe His Ile Glu Asp Gly Lys Ile Asp Gly Asn
625                 630                 635                 640

ggt ttc cac gcg aca gcg cgc act cgg gag agc ggc atc aat ctt tcg   1968
Gly Phe His Ala Thr Ala Arg Thr Arg Glu Ser Gly Ile Asn Leu Ser
                645                 650                 655

gga aat ggt tcg acc gac ccc aaa aca ttc caa gct agt aat ctt cgt   2016
Gly Asn Gly Ser Thr Asp Pro Lys Thr Phe Gln Ala Ser Asn Leu Arg
            660                 665                 670

gta gaa gga gga ttt tac ggc ccg cag gcg gcg gaa ttg ggc ggt act   2064
Val Glu Gly Gly Phe Tyr Gly Pro Gln Ala Ala Glu Leu Gly Gly Thr
        675                 680                 685

att ttc aat aat gat ggg aaa tct ctt agt ata act gaa aat att gaa   2112
Ile Phe Asn Asn Asp Gly Lys Ser Leu Ser Ile Thr Glu Asn Ile Glu
    690                 695                 700

aat gaa gct gaa gct gaa gtt gaa gtt gaa gct gaa gct gaa gtt gaa   2160
Asn Glu Ala Glu Ala Glu Val Glu Val Glu Ala Glu Ala Glu Val Glu
705                 710                 715                 720

gtt gaa gct gat gtt ggc aaa cag tta gaa cct gat gaa gtt aaa cac   2208
Val Glu Ala Asp Val Gly Lys Gln Leu Glu Pro Asp Glu Val Lys His
                725                 730                 735

aaa ttc ggc gtg gta ttc ggt gcg aag aaa gat atg cag gag gtg gaa   2256
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Lys Phe Gly Val Val Phe Gly Ala Lys Lys Asp Met Gln Glu Val Glu
740 745 750

aaa tga 2262
Lys

<210> 8
<211> 753
<212> PRT
<213> Neisseria meningitidis strain M990

<400> 8
Met Cys Lys Pro Asn Tyr Gly Gly Ile Val Leu Leu Pro Leu Leu Leu
1 5 10 15
Ala Ser Cys Ile Gly Gly Asn Phe Gly Val Gln Pro Val Val Glu Ser
20 25 30
Thr Pro Thr Ala Pro Thr Leu Ser Asp Ser Lys Ser Ser Asn Pro Ala
35 40 45
Asp Lys Pro Ala Pro Ala Pro Ala Glu Pro Ser Val Glu Ile Thr Pro
50 55 60
Val Lys Arg Pro Ala Val Gly Ala Ala Met Arg Leu Pro Arg Arg Asn
65 70 75 80
Ile Ala Thr Phe Asp Lys Asn Gly Asn Glu Ile Pro Asn Ser Lys Gln
85 90 95
Ala Glu Glu Tyr Leu Pro Leu Lys Glu Lys Asp Ile Leu Phe Leu Asp
100 105 110
Gly Thr Pro Lys Glu Gln Ala Asp Lys Leu Lys Lys Glu Ile Asn Gly
115 120 125
Arg His Pro Asn Ala Pro Ile Tyr Thr Ser Asp Leu Lys Asp Asp Ala
130 135 140
Tyr Gln Tyr Lys Tyr Val Arg Ala Gly Tyr Val Tyr Thr Arg Tyr Gly
145 150 155 160
Thr Asp Glu Ile Glu Gln Asn Ser Gly Gly Lys Arg Val Thr His Arg
165 170 175
Leu Gly Tyr Asp Gly Phe Val Tyr Tyr Ser Gly Glu Arg Pro Ser Gln
180 185 190
Ser Leu Pro Ser Ala Gly Thr Val Glu Tyr Ser Gly Asn Trp Gln Tyr
195 200 205
Met Thr Asp Ala Lys Arg His Arg Ala Gly Gln Ala Val Gly Ile Asp
210 215 220
Asn Leu Gly Tyr Ile Thr Phe Tyr Gly Asn Asp Val Gly Ala Thr Ser

225 230 235 240
Tyr Ala Ala Lys Asp Val Asp Glu Arg Glu Lys His Pro Ala Lys Tyr
245 250 255
Thr Val Asp Phe Asp Asn Lys Thr Met Asn Gly Lys Leu Ile Lys Asn
260 265 270
Gln Tyr Val Arg Asn Lys Lys Asp Glu Pro Lys Lys Pro Leu Thr Ile
275 280 285
Tyr Asp Ile Thr Ala Lys Leu Asp Gly Asn Arg Phe Thr Gly Ser Ala
290 295 300
Lys Val Asn Pro Asp Leu Ala Lys Asn Leu Ala Gly Asn Glu Arg Leu
305 310 315 320
Phe Phe His Ala Asp Ala Asp Gln Arg Leu Glu Gly Gly Phe Phe Gly
325 330 335
Asp Asn Gly Glu Glu Leu Ala Gly Arg Phe Ile Ser Asn Asp Asn Ser
340 345 350
Val Phe Gly Val Phe Ala Gly Lys Lys Thr Glu Thr Ala Asn Ala Ala
355 360 365
Asp Thr Lys Pro Ala Leu Pro Ser Gly Lys His Thr Lys Ile Leu Asp
370 375 380
Ser Leu Lys Ile Ser Val Asp Glu Ala Thr Asp Gly His Ala Arg Lys
385 390 395 400
Phe Ala Ile Ser Ser Met Pro Asp Phe Gly His Pro Asp Lys Leu Leu
405 410 415
Val Glu Gly Arg Glu Ile Pro Leu Val Asn Glu Glu Gln Ile Ile Lys
420 425 430
Leu Ala Asp Gly Arg Lys Met Thr Val Arg Ala Cys Cys Asp Phe Leu
435 440 445
Thr Tyr Val Lys Leu Gly Arg Ile Lys Thr Asp Arg Pro Ala Ser Lys
450 455 460
Pro Lys Ala Glu Asp Lys Gly Glu Asp Glu Glu Gly Ala Gly Val Asp
465 470 475 480
Asn Asp Glu Glu Ser Glu Asp Glu Ala Val Glu Asp Glu Gly Gly Glu
485 490 495
Glu Asp Glu Thr Ser Glu Glu Asp Asn Gly Glu Asp Glu Glu Ala Thr
500 505 510
Ala Glu Glu Glu Thr Glu Glu Val Asp Glu Ala Glu Glu Glu Glu Val
515 520 525
Glu Glu Pro Glu Glu Lys Ser Pro Ala Glu Gly Asn Gly Gly Ser Gly
530 535 540
Ser Ile Leu Pro Ala Leu Glu Ala Ser Lys Gly Arg Asp Ile Asp Leu
545 550 555 560
Phe Leu Lys Gly Ile Arg Thr Ala Glu Thr Asp Ile Pro Gln Ser Gly
565 570 575

```
Thr Ala His Tyr Thr Gly Thr Trp Glu Ala Arg Ile Gly Lys Pro Ile
            580                 585                 590
Gln Trp Asp Asn Gln Ala Asp Glu Lys Ala Ala Lys Ala Glu Phe Thr
        595                 600                 605
Val Asp Phe Asp Lys Lys Ser Ile Ser Gly Lys Leu Thr Glu Gln Asn
    610                 615                 620
Gly Val Glu Pro Ala Phe His Ile Glu Asp Gly Lys Ile Asp Gly Asn
625                 630                 635                 640
Gly Phe His Ala Thr Ala Arg Thr Arg Glu Ser Gly Ile Asn Leu Ser
                645                 650                 655
Gly Asn Gly Ser Thr Asp Pro Lys Thr Phe Gln Ala Ser Asn Leu Arg
            660                 665                 670
Val Glu Gly Gly Phe Tyr Gly Pro Gln Ala Ala Glu Leu Gly Gly Thr
        675                 680                 685
Ile Phe Asn Asn Asp Gly Lys Ser Leu Ser Ile Thr Glu Asn Ile Glu
    690                 695                 700
Asn Glu Ala Glu Ala Glu Val Glu Val Glu Ala Glu Ala Glu Val Glu
705                 710                 715                 720
Val Glu Ala Asp Val Gly Lys Gln Leu Glu Pro Asp Glu Val Lys His
                725                 730                 735
Lys Phe Gly Val Val Phe Gly Ala Lys Lys Asp Met Gln Glu Val Glu
            740                 745                 750
Lys
```

<210> 9
<211> 2124
<212> DNA
<213> Neisseria meningitidis strain 881607

<220>
<221> CDS
<222> (1)...(2121)

<400> 9

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atg tgt aaa ccg aat tat ggc ggc att gtc ttg ttg ccc tta ctt ttg   48
Met Cys Lys Pro Asn Tyr Gly Gly Ile Val Leu Leu Pro Leu Leu Leu
 1               5                  10                  15

gca tct tgc atc ggc ggc aat ttc ggc gtg cag cct gtt gtc gaa tca   96
Ala Ser Cys Ile Gly Gly Asn Phe Gly Val Gln Pro Val Val Glu Ser
            20                  25                  30
```

```
acg ccg acc gcg tac ccc gtc act ttc aag tct aag gac gtt ccc act   144
Thr Pro Thr Ala Tyr Pro Val Thr Phe Lys Ser Lys Asp Val Pro Thr
         35                  40                  45

tcg cct cct gcc ggg tct tcg gta gaa acc acg ccg gtc aac cga ccc   192
Ser Pro Pro Ala Gly Ser Ser Val Glu Thr Thr Pro Val Asn Arg Pro
     50                  55                  60

gcc gtt ggt gcg gca atg cgg ctg ttg aga cgg aat att gca act tct   240
Ala Val Gly Ala Ala Met Arg Leu Leu Arg Arg Asn Ile Ala Thr Ser
 65                  70                  75                  80

gat aag gat ggc aat gat ttt cca aat agc aaa caa gca gaa gaa aag   288
Asp Lys Asp Gly Asn Asp Phe Pro Asn Ser Lys Gln Ala Glu Glu Lys
                 85                  90                  95

ctg tcg ttt aaa gag gaa gat atc ctg ttt tta tac ggt tcc aaa aaa   336
Leu Ser Phe Lys Glu Glu Asp Ile Leu Phe Leu Tyr Gly Ser Lys Lys
            100                 105                 110

gat caa cgt cag cag ctt aaa gat aaa att cgt caa cca aat cct acg   384
Asp Gln Arg Gln Gln Leu Lys Asp Lys Ile Arg Gln Pro Asn Pro Thr
        115                 120                 125

gca agc att acc aca tcg gaa aag aaa aat aaa aaa tat gat tat aaa   432
Ala Ser Ile Thr Thr Ser Glu Lys Lys Asn Lys Lys Tyr Asp Tyr Lys
    130                 135                 140

ttt gta gat gca ggt tat gta tat act aaa gac gga aaa gat gaa att   480
Phe Val Asp Ala Gly Tyr Val Tyr Thr Lys Asp Gly Lys Asp Glu Ile
145                 150                 155                 160

gag tgg act tca aat tac aag cag tct acc aac cgg ttt ggt tat gac   528
Glu Trp Thr Ser Asn Tyr Lys Gln Ser Thr Asn Arg Phe Gly Tyr Asp
                165                 170                 175

ggt ttt gta tat tat tcc gga gaa cat cct tcg caa tct tta ccg agc   576
Gly Phe Val Tyr Tyr Ser Gly Glu His Pro Ser Gln Ser Leu Pro Ser
            180                 185                 190

gcg gga acg gtg aaa tat tcc ggc aac tgg caa tat atg acc gat gcc   624
Ala Gly Thr Val Lys Tyr Ser Gly Asn Trp Gln Tyr Met Thr Asp Ala
```

```
        195                 200                 205

ata cgt cat cga aca gga aaa gca gga gat cct agc gaa gat ttg ggt   672
Ile Arg His Arg Thr Gly Lys Ala Gly Asp Pro Ser Glu Asp Leu Gly
    210                 215                 220

tat atc gtt tat tac ggt caa aat gtc gga gca act tct tat gct gcg   720
Tyr Ile Val Tyr Tyr Gly Gln Asn Val Gly Ala Thr Ser Tyr Ala Ala
225                 230                 235                 240

act gcc gac gac cgg gag gga aaa cat cct gcc gaa tat acg gtt aat   768
Thr Ala Asp Asp Arg Glu Gly Lys His Pro Ala Glu Tyr Thr Val Asn
                245                 250                 255

ttc gac caa aaa act ctg aat ggc aag ctg att aaa aat cag tat gtg   816
Phe Asp Gln Lys Thr Leu Asn Gly Lys Leu Ile Lys Asn Gln Tyr Val
            260                 265                 270

caa aag aga gat gat cct aaa aaa cca ctg acc att tac gac att act   864
Gln Lys Arg Asp Asp Pro Lys Lys Pro Leu Thr Ile Tyr Asp Ile Thr
        275                 280                 285

gca aaa ttg gac ggc aac cgc ttt acc ggc agt gcc aaa gtt aac aca   912
Ala Lys Leu Asp Gly Asn Arg Phe Thr Gly Ser Ala Lys Val Asn Thr
    290                 295                 300

gag gtg aag acg aat cac gct gat aaa gaa tat ttg ttt ttc cat acc   960
Glu Val Lys Thr Asn His Ala Asp Lys Glu Tyr Leu Phe Phe His Thr
305                 310                 315                 320

gat gcc gat cag cgg ctt gag ggc ggt ttt ttc ggc gat aag ggg gaa  1008
Asp Ala Asp Gln Arg Leu Glu Gly Gly Phe Phe Gly Asp Lys Gly Glu
                325                 330                 335

gag ctt gcc gga cgg ttt atc agc aac gac aac agc gta ttc ggc gtg  1056
Glu Leu Ala Gly Arg Phe Ile Ser Asn Asp Asn Ser Val Phe Gly Val
            340                 345                 350

ttc gca ggc aaa caa aaa aca gag aca gca aac gca tca gat aca aat  1104
Phe Ala Gly Lys Gln Lys Thr Glu Thr Ala Asn Ala Ser Asp Thr Asn
        355                 360                 365

cct gcc ctg ccg tct gga aaa cac acc aaa atc ttg gat tct cta aaa  1152
```

```
Pro Ala Leu Pro Ser Gly Lys His Thr Lys Ile Leu Asp Ser Leu Lys
    370                 375                 380

att tcc gtt gac gag gca agt ggt gaa aat ccc cga ccg ttt gag gtt   1200
Ile Ser Val Asp Glu Ala Ser Gly Glu Asn Pro Arg Pro Phe Glu Val
385                 390                 395                 400

tcc act atg ccc gat ttt ggt cat ccc gac aaa ctt ctt gtc gaa ggg   1248
Ser Thr Met Pro Asp Phe Gly His Pro Asp Lys Leu Leu Val Glu Gly
                405                 410                 415

cgt gaa att cct ttg gta aac aaa gaa caa acc atc gat ctt gcc gac   1296
Arg Glu Ile Pro Leu Val Asn Lys Glu Gln Thr Ile Asp Leu Ala Asp
            420                 425                 430

ggc agg aaa atg acc gtc cgt gct tgt tgc gac ttt ttg acc tat gtg   1344
Gly Arg Lys Met Thr Val Arg Ala Cys Cys Asp Phe Leu Thr Tyr Val
        435                 440                 445

aaa ctc gga cgg ata aaa acc gaa cgc ccc gcc gtc caa ccg aag gcg   1392
Lys Leu Gly Arg Ile Lys Thr Glu Arg Pro Ala Val Gln Pro Lys Ala
    450                 455                 460

cag gat gaa gag ggg gac gaa gag ggt gta ggc gtt gat aac ggt aaa   1440
Gln Asp Glu Glu Gly Asp Glu Glu Gly Val Gly Val Asp Asn Gly Lys
465                 470                 475                 480

gaa agc gaa gac gaa atc ggc gat gaa gaa agc acc gga gac gaa gtc   1488
Glu Ser Glu Asp Glu Ile Gly Asp Glu Glu Ser Thr Gly Asp Glu Val
                485                 490                 495

gta gaa gat gaa gac gaa gat gaa gac gaa gaa gaa atc gaa gaa gaa   1536
Val Glu Asp Glu Asp Glu Asp Glu Asp Glu Glu Glu Ile Glu Glu Glu
            500                 505                 510

cct gaa gaa gaa gct gaa gag gaa gaa ccc gaa gaa gaa ttg ccg gca   1584
Pro Glu Glu Glu Ala Glu Glu Glu Glu Pro Glu Glu Glu Leu Pro Ala
        515                 520                 525

gaa gaa ggc aac ggc ggt tca ggc agc atc ctg ccc act ccg gaa gcc   1632
Glu Glu Gly Asn Gly Gly Ser Gly Ser Ile Leu Pro Thr Pro Glu Ala
    530                 535                 540
```

```
tct aaa ggc agg gac atc gac ctt ttc ctg aaa ggt atc cgc acg gcg   1680
Ser Lys Gly Arg Asp Ile Asp Leu Phe Leu Lys Gly Ile Arg Thr Ala
545                 550                 555                 560

gaa gcc gac att cca aaa aac gga acg gcg cat tat acc ggc act tgg   1728
Glu Ala Asp Ile Pro Lys Asn Gly Thr Ala His Tyr Thr Gly Thr Trp
                565                 570                 575

gaa gcg cgt atc ggc gta tcg gat agt ggt acg tcc att caa aag gat   1776
Glu Ala Arg Ile Gly Val Ser Asp Ser Gly Thr Ser Ile Gln Lys Asp
            580                 585                 590

agc tat gcg aat caa ggg gca aaa gca gaa ttt acc gtt gat ttc gaa   1824
Ser Tyr Ala Asn Gln Gly Ala Lys Ala Glu Phe Thr Val Asp Phe Glu
        595                 600                 605

gcg aag acg gtg tcc gga atg ctg aca gaa aaa aat gat aca acc ccc   1872
Ala Lys Thr Val Ser Gly Met Leu Thr Glu Lys Asn Asp Thr Thr Pro
    610                 615                 620

gct ttt tat att gaa aaa ggt gtg att gac ggt aac ggt ttc cac gct   1920
Ala Phe Tyr Ile Glu Lys Gly Val Ile Asp Gly Asn Gly Phe His Ala
625                 630                 635                 640

ttg gcg cat act cgg gag aac ggt att gac ctt tct ggg cag ggt tcg   1968
Leu Ala His Thr Arg Glu Asn Gly Ile Asp Leu Ser Gly Gln Gly Ser
                645                 650                 655

act aac ccg aag aac ttc aaa gcc gac aat ctt ctt gta aca ggc ggc   2016
Thr Asn Pro Lys Asn Phe Lys Ala Asp Asn Leu Leu Val Thr Gly Gly
            660                 665                 670

ttt tat ggc ccg cag gcg gca gaa ttg ggc ggt aat att atc gac agc   2064
Phe Tyr Gly Pro Gln Ala Ala Glu Leu Gly Gly Asn Ile Ile Asp Ser
        675                 680                 685

gac cgg aaa ttc ggt gcg gta ttt ggg gcg aaa aaa gat gac aag gag   2112
Asp Arg Lys Phe Gly Ala Val Phe Gly Ala Lys Lys Asp Asp Lys Glu
    690                 695                 700

gca aca cga tga                                                  2124
Ala Thr Arg
705
```

<210> 10
<211> 707
<212> PRT
<213> Neisseria meningitidis strain 881607

<400> 10
Met Cys Lys Pro Asn Tyr Gly Gly Ile Val Leu Leu Pro Leu Leu Leu
1 5 10 15
Ala Ser Cys Ile Gly Gly Asn Phe Gly Val Gln Pro Val Val Glu Ser
20 25 30
Thr Pro Thr Ala Tyr Pro Val Thr Phe Lys Ser Lys Asp Val Pro Thr
35 40 45
Ser Pro Pro Ala Gly Ser Ser Val Glu Thr Thr Pro Val Asn Arg Pro
50 55 60
Ala Val Gly Ala Ala Met Arg Leu Leu Arg Arg Asn Ile Ala Thr Ser
65 70 75 80
Asp Lys Asp Gly Asn Asp Phe Pro Asn Ser Lys Gln Ala Glu Glu Lys
85 90 95
Leu Ser Phe Lys Glu Glu Asp Ile Leu Phe Leu Tyr Gly Ser Lys Lys
100 105 110
Asp Gln Arg Gln Gln Leu Lys Asp Lys Ile Arg Gln Pro Asn Pro Thr
115 120 125
Ala Ser Ile Thr Thr Ser Glu Lys Lys Asn Lys Lys Tyr Asp Tyr Lys
130 135 140
Phe Val Asp Ala Gly Tyr Val Tyr Thr Lys Asp Gly Lys Asp Glu Ile
145 150 155 160
Glu Trp Thr Ser Asn Tyr Lys Gln Ser Thr Asn Arg Phe Gly Tyr Asp
165 170 175
Gly Phe Val Tyr Tyr Ser Gly Glu His Pro Ser Gln Ser Leu Pro Ser
180 185 190
Ala Gly Thr Val Lys Tyr Ser Gly Asn Trp Gln Tyr Met Thr Asp Ala
195 200 205
Ile Arg His Arg Thr Gly Lys Ala Gly Asp Pro Ser Glu Asp Leu Gly
210 215 220
Tyr Ile Val Tyr Tyr Gly Gln Asn Val Gly Ala Thr Ser Tyr Ala Ala
225 230 235 240
Thr Ala Asp Asp Arg Glu Gly Lys His Pro Ala Glu Tyr Thr Val Asn
245 250 255
Phe Asp Gln Lys Thr Leu Asn Gly Lys Leu Ile Lys Asn Gln Tyr Val
260 265 270
Gln Lys Arg Asp Asp Pro Lys Lys Pro Leu Thr Ile Tyr Asp Ile Thr

```
        275                 280                 285
Ala Lys Leu Asp Gly Asn Arg Phe Thr Gly Ser Ala Lys Val Asn Thr
    290                 295                 300
Glu Val Lys Thr Asn His Ala Asp Lys Glu Tyr Leu Phe Phe His Thr
305                 310                 315                 320
Asp Ala Asp Gln Arg Leu Glu Gly Gly Phe Phe Gly Asp Lys Gly Glu
                325                 330                 335
Glu Leu Ala Gly Arg Phe Ile Ser Asn Asp Asn Ser Val Phe Gly Val
            340                 345                 350
Phe Ala Gly Lys Gln Lys Thr Glu Thr Ala Asn Ala Ser Asp Thr Asn
        355                 360                 365
Pro Ala Leu Pro Ser Gly Lys His Thr Lys Ile Leu Asp Ser Leu Lys
    370                 375                 380
Ile Ser Val Asp Glu Ala Ser Gly Glu Asn Pro Arg Pro Phe Glu Val
385                 390                 395                 400
Ser Thr Met Pro Asp Phe Gly His Pro Asp Lys Leu Leu Val Glu Gly
                405                 410                 415
Arg Glu Ile Pro Leu Val Asn Lys Glu Gln Thr Ile Asp Leu Ala Asp
            420                 425                 430
Gly Arg Lys Met Thr Val Arg Ala Cys Cys Asp Phe Leu Thr Tyr Val
        435                 440                 445
Lys Leu Gly Arg Ile Lys Thr Glu Arg Pro Ala Val Gln Pro Lys Ala
    450                 455                 460
Gln Asp Glu Glu Gly Asp Glu Glu Gly Val Gly Val Asp Asn Gly Lys
465                 470                 475                 480
Glu Ser Glu Asp Glu Ile Gly Asp Glu Glu Ser Thr Gly Asp Glu Val
                485                 490                 495
Val Glu Asp Glu Asp Glu Asp Glu Asp Glu Glu Glu Ile Glu Glu Glu
            500                 505                 510
Pro Glu Glu Glu Ala Glu Glu Glu Glu Pro Glu Glu Glu Leu Pro Ala
        515                 520                 525
Glu Glu Gly Asn Gly Gly Ser Gly Ser Ile Leu Pro Thr Pro Glu Ala
    530                 535                 540
Ser Lys Gly Arg Asp Ile Asp Leu Phe Leu Lys Gly Ile Arg Thr Ala
545                 550                 555                 560
Glu Ala Asp Ile Pro Lys Asn Gly Thr Ala His Tyr Thr Gly Thr Trp
                565                 570                 575
Glu Ala Arg Ile Gly Val Ser Asp Ser Gly Thr Ser Ile Gln Lys Asp
            580                 585                 590
Ser Tyr Ala Asn Gln Gly Ala Lys Ala Glu Phe Thr Val Asp Phe Glu
        595                 600                 605
Ala Lys Thr Val Ser Gly Met Leu Thr Glu Lys Asn Asp Thr Thr Pro
    610                 615                 620
```

```
Ala Phe Tyr Ile Glu Lys Gly Val Ile Asp Gly Asn Gly Phe His Ala
625                 630                 635                 640
Leu Ala His Thr Arg Glu Asn Gly Ile Asp Leu Ser Gly Gln Gly Ser
                645                 650                 655
Thr Asn Pro Lys Asn Phe Lys Ala Asp Asn Leu Leu Val Thr Gly Gly
            660                 665                 670
Phe Tyr Gly Pro Gln Ala Ala Glu Leu Gly Gly Asn Ile Ile Asp Ser
        675                 680                 685
Asp Arg Lys Phe Gly Ala Val Phe Gly Ala Lys Lys Asp Asp Lys Glu
    690                 695                 700
Ala Thr Arg
705
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<210> 11
<211> 94
<212> DNA
<213> Neisseria meningitidis

<400> 11
cgggttgata ttatctgtac atattaatat aatgataatt attattaatc aaataggagg 60
aaaagtaggg atgtgtaaac cgaattatgg cggc 94

<210> 12
<211> 599
<212> PRT
<213> Neisseria meningitidis strain B16B6

<400> 12

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Met Asn Asn Pro Leu Val Asn Gln Ala Ala Met Val Leu Pro Val Phe
 1               5                  10                  15
Leu Leu Ser Ala Cys Leu Gly Gly Gly Gly Ser Phe Asp Leu Asp Ser
            20                  25                  30
Val Glu Thr Val Gln Asp Met His Ser Lys Pro Lys Tyr Glu Asp Glu
        35                  40                  45
Lys Ser Gln Pro Glu Ser Gln Gln Asp Val Ser Glu Asn Ser Gly Ala
    50                  55                  60
Ala Tyr Gly Phe Ala Val Lys Leu Pro Arg Arg Asn Ala His Phe Asn
65                  70                  75                  80
Pro Lys Tyr Lys Glu Lys His Lys Pro Leu Gly Ser Met Asp Trp Lys
                85                  90                  95
Lys Leu Gln Arg Gly Glu Pro Asn Ser Phe Ser Glu Arg Asp Glu Leu
            100                 105                 110
```

Glu Lys Lys Arg Gly Ser Ser Glu Leu Ile Glu Ser Lys Trp Glu Asp
115 120 125
Gly Gln Ser Arg Val Val Gly Tyr Thr Asn Phe Thr Tyr Val Arg Ser
130 135 140
Gly Tyr Val Tyr Leu Asn Lys Asn Asn Ile Asp Ile Lys Asn Asn Ile
145 150 155 160
Val Leu Phe Gly Pro Asp Gly Tyr Leu Tyr Tyr Lys Gly Lys Glu Pro
165 170 175
Ser Lys Glu Leu Pro Ser Glu Lys Ile Thr Tyr Lys Gly Thr Trp Asp
180 185 190
Tyr Val Thr Asp Ala Met Glu Lys Gln Arg Phe Glu Gly Leu Gly Ser
195 200 205
Ala Ala Gly Gly Asp Lys Ser Gly Ala Leu Ser Ala Leu Glu Glu Gly
210 215 220
Val Leu Arg Asn Gln Ala Glu Ala Ser Ser Gly His Thr Asp Phe Gly
225 230 235 240
Met Thr Ser Glu Phe Glu Val Asp Phe Ser Asp Lys Thr Ile Lys Gly
245 250 255
Thr Leu Tyr Arg Asn Asn Arg Ile Thr Gln Asn Asn Ser Glu Asn Lys
260 265 270
Gln Ile Lys Thr Thr Arg Tyr Thr Ile Gln Ala Thr Leu His Gly Asn
275 280 285
Arg Phe Lys Gly Lys Ala Leu Ala Ala Asp Lys Gly Ala Thr Asn Gly
290 295 300
Ser His Pro Phe Ile Ser Asp Ser Asp Ser Leu Glu Gly Gly Phe Tyr
305 310 315 320
Gly Pro Lys Gly Glu Glu Leu Ala Gly Lys Phe Leu Ser Asn Asp Asn
325 330 335
Lys Val Ala Ala Val Phe Gly Ala Lys Gln Lys Asp Lys Lys Asp Gly
340 345 350
Glu Asn Ala Ala Gly Pro Ala Thr Glu Thr Val Ile Asp Ala Tyr Arg
355 360 365
Ile Thr Gly Glu Glu Phe Lys Lys Glu Gln Ile Asp Ser Phe Gly Asp
370 375 380
Val Lys Lys Leu Leu Val Asp Gly Val Glu Leu Ser Leu Leu Pro Ser
385 390 395 400
Glu Gly Asn Lys Ala Ala Phe Gln His Glu Ile Glu Gln Asn Gly Val
405 410 415
Lys Ala Thr Val Cys Cys Ser Asn Leu Asp Tyr Met Ser Phe Gly Lys
420 425 430
Leu Ser Lys Glu Asn Lys Asp Asp Met Phe Leu Gln Gly Val Arg Thr
435 440 445
Pro Val Ser Asp Val Ala Ala Arg Thr Glu Ala Asn Ala Lys Tyr Arg

```
    450                 455                 460
Gly Thr Trp Tyr Gly Tyr Ile Ala Asn Gly Thr Ser Trp Ser Gly Glu
465                 470                 475                 480
Ala Ser Asn Gln Glu Gly Gly Asn Arg Ala Glu Phe Asp Val Asp Phe
                485                 490                 495
Ser Thr Lys Lys Ile Ser Gly Thr Leu Thr Ala Lys Asp Arg Thr Ser
            500                 505                 510
Pro Ala Phe Thr Ile Thr Ala Met Ile Lys Asp Asn Gly Phe Ser Gly
        515                 520                 525
Val Ala Lys Thr Gly Glu Asn Gly Phe Ala Leu Asp Pro Gln Asn Thr
    530                 535                 540
Gly Asn Ser His Tyr Thr His Ile Glu Ala Thr Val Ser Gly Gly Phe
545                 550                 555                 560
Tyr Gly Lys Asn Ala Ile Glu Met Gly Gly Ser Phe Ser Phe Pro Gly
                565                 570                 575
Asn Ala Pro Glu Gly Lys Gln Glu Lys Ala Ser Val Val Phe Gly Ala
            580                 585                 590
Lys Arg Gln Gln Leu Val Gln
        595
```